

8

Quantity Theory of Money- Cash Balances Approach

In view of several shortcomings in Fisher's transactions velocity model, the Cambridge economists including Marshall, Pigou, Keynes and Robertson developed the cash balances, approach. The different aspects of this approach to money and prices have been discussed in this chapter.

1. CASH BALANCES APPROACH OR CAMBRIDGE APPROACH

The cash balances approach was mainly developed during the 1920's as a refinement of Fisher's Quantity Theory by the Cambridge economists like Alfred Marshall, A.C. Pigou, D.H. Robertson and J.M. Keynes.

Fisher's transactions model is deficient since it fails to integrate the theory of money and that of prices. The Cambridge approach attempted, though unsuccessfully, to bring about an integration between the two. The theory of value of money is only a special case of the general theory of value. Thus the value of money must be determined on the basis of the demand for and the supply of money. Fisher's transactions model laid its entire weight on the supply side and hence provided a lop-sided theory. The Cambridge approach gives due importance to the demand for money. It is explicitly concerned with the different motives for which money is demanded by the people. Money, no doubt, is demanded for facilitating transactions as it acts as useful medium of exchange but the real demand for it stems not from those who want to exchange it for other commodities and services but from those who want to hold it as a store of value so that business transactions should be rendered smooth and easy and a person may secure an advantage in bargaining. In addition, the holding of cash may help a person in facing unforeseen

contingencies. Thus, the essential motives for the holding of money are related to the conduct of transactions and a sense of precaution. The community desires to hold a certain proportion of its annual real national income or output in the form of cash. Hence at a given point of time, the aggregate demand by the community for cash balances is not the total amount of money in circulation but only a certain fraction of the annual real national income. The entire approach has been explicitly stated by **Marshall** in the following words, "In every society, there is some fraction of their income which people find it worth while to keep in the form of currency: it may be a fifth or a tenth or a twentieth. A large command of resources in the form of currency renders their business easy, smooth and puts them at an advantage in bargaining, but on the other hand, it locks up in a barren form resources that might yield an income or gratification if invested say, in extra furniture; or a money income if invested in extra machinery or cattle. Let us suppose that the inhabitants of a country, taken one with another [and including therefore all varieties of character and of occupation] find it just worth their while to keep by them on the average ready purchasing power to the extent of a tenth part of their annual income, together with a fiftieth part of their property; then the aggregate value of the currency of the country will tend to be equal to the sum of these amounts."

Marshall's Cash Balance Equation

From the above statement, it is clear that the total demand for money is a function of the annual income and the size of assets and the demand function for money, according to Marshall, can be expressed as

$$M = KY + K'A$$

M in Fig. 1 is the demand function for money which is a function of KR. It slopes negatively because a unit of money must be worth less in terms of goods and services, if the people are induced to hold more money. The curve, being a rectangular hyperbola, tends to approach the two axes but actually never touches either of them. Given this shape of money demand function, any change in the quantity of money brings about inversely proportionate changes in the value of money. Assuming that the supply of money is determined autonomously by the monetary authority in a country, M_0M_0 , M_1M_1 and M_2M_2 are the vertical money supply curves. When quantity of money is increased from M_0 to M_1 , the value of money falls from P_0 to P_1 and as the quantity of money is reduced from M_0 to M_2 , the value of money rises from P_0 to P_2 . The changes in the quantity of money and the value of money are in exact inverse proportion to each other.

Pigou's equation explains the reason why money has any value at all and why do people decide to hold larger or smaller proportions of their income in the form of money. During a period of rising prices, since the value of money declines, people want to hold a smaller proportion of their income in the form of cash. During the period of depression, since the value of money increases under such circumstances the magnitude of K registers an increase.

But Keynes was not satisfied with Pigou's equation. R in Pigou's equation is, no doubt, of great significance, yet Keynes believed that this significance was greatly diminished when the total deposits (demand deposits + saving or time deposits) and not merely the income deposits (demand deposits) were taken into account. Moreover, Keynes pointed out that Pigou evaded the equation of the value of money in general by measuring R and K in terms of a single commodity like wheat.

Keynes' Cash Balance Equation

In his book, *A Tract on Monetary Reform*, Keynes formulated the following equation called as *Real Balance Equation* :

$$n = p (k + rk') \quad \dots(vi)$$

where n represents the amount of cash in circulation ; p is the price of a consumption unit (constituted by a collection of specified quantities of the standard articles that enter into consumption of the

community); k is the amount of consumption units that the people decide to hold in the form of cash ; and k' is the amount of consumption units that the people decide to hold in the form of bank deposits and r is the cash reserve ratio of the banks.

The magnitude of r depends upon the reserve practices followed by the banking system and the proportion between k and k' depends upon the banking arrangements and habits of the people. If the magnitudes of r , k and k' remain constant, n and p rise and fall together in the same proportion. Keynes also contended that cyclical variations could not be due to changes in n or r but to the changes in k and k' .

Keynes' real balance equation suffers from certain defects. Actually Keynes himself recognized its defects and made a mention of them in his *Treatise*. The major defects are given below :

(i) The variable p has been used in a very restricted sense. It does not measure the general purchasing power of money but refers to the price level of consumption units alone.

(ii) The equation relates only to the consumption goods and fails to take into account industrial and financial transactions.

(iii) Since the variable p measures only the price level of consumption units, it suggests that the people hold money simply to procure consumption goods. But the money, in fact, is held for "a vast multiplicity of business and personal purposes."

(iv) Keynes' real balance equation makes a misapplication of the conception to the cash-deposits as a whole which was appropriate only to the income deposits.

(v) Keynes also recognized that the proportional relationship between n and p is invalid particularly in the short period when k , k' and r might undergo change as a result of variations in n . Actually p may change disproportionately to the change in n depending upon the volatile behaviour of k , k' and r .

In view of these deficiencies in the real balance equation, Keynes abandoned this approach to money and price altogether in his *General Theory*. Instead, he developed income-expenditure approach to provide an appropriate explanation for the

relationship between the quantity of money and the price level.

Robertson's Cash Balance Equation

Another noted advocate of the Cambridge approach is D. H. Robertson. He gave the following cash balance equation :

$$M = KTP \quad \dots(vii)$$

or
$$P = \frac{M}{KT}$$

where P is the price level ; M is the supply of money ; and T is the amount of goods and services which is to be purchased during a year *i.e.*, it is the volume of annual transactions. K is the fraction of T over which people want to hold command in the form of cash balances.

The Robertsonian cash balance equation is sometimes considered as better than the equations given by other Cambridge writers primarily because of its easy and straight comparability with that of Fisher's approach. Fisher's transactions equation

$P = \frac{MV}{T}$ and Robertson's equation, $P = \frac{M}{KT}$ involve the same variables, if we consider V as the reciprocal of K *i.e.*, $1/K = V$. Just as Fisher postulates a direct and proportional relationship between M and P on the assumption of the constancy of V and T, similarly Robertson's equation too explains a direct and proportional relation between M and P, if T and K are supposed as constant. The main difference between the two approaches is that Fisher's approach attaches importance to the spending of money, while Robertsonian approach gives importance to the holding (or non-spending) of money.

2. COMPARISON BETWEEN TRANSACTIONS AND CASH BALANCES APPROACHES

There is a strong belief among a number of writers that the neoclassical cash balance and Fisher's transactions velocity models provide explanation for the same thing and there is no fundamental difference between the two. In fact, the two approaches are similar in certain respects, while in certain other respects there are differences also. To institute a proper comparison between the two, we shall study first the points of their similarity.

Similarities

(i) *Same conclusion about M and P* : The basic conclusion in both the approaches is the same that the value of money or the price level is a function of the quantity of money.

(ii) *Similarity in form* : It is possible to compare directly the transactions and cash balance equations. Robertson's cash balance equation is much similar in form to the equation of exchange.

Fisher's transactions equation states that $P = MV/T$ and Robertson considers $P = M/KT$. The only apparent difference between the two is in respect of terms V and K. But V and K, in fact, tend to be the reciprocals of each other. $V = 1/K$ or $K = 1/V$. To say that the velocity of money (V) has increased, amounts to saying that the demand for money as a store of value has gone down and vice-versa. Thus the two equations simply emphasise the different elements of the same phenomenon.

(iii) *Money as a medium of exchange* : There is no doubt that the transactions approach considers money as a flow and the cash balances approach treats it as stock, yet both consider that money serves as a medium of exchange in the economic system.

Differences

These similarities in two approaches notwithstanding, it cannot be conceded that they amount to the same thing. The two approaches have very notable differences which are given below :

(i) *Difference pertaining to time* : Fisher's transactions equation explains the value of money over a period of time, while the cash balance equation views the determination of price level or the value of money at a point of time.

(ii) *Treatment of money as a stock and a flow* : The transactions velocity model looks upon money as a flow, while the cash-balances model treats it as stock. It is precisely for this reason that the concept of velocity of circulation of money, which has been given scant importance in the latter, becomes strategically significant in the former.

(iii) *Spending or holding aspect of money* : The transactions approach gives an explicit support to the contention that money serves only as a medium of exchange, while the cash balance approach gives importance of the store of value function of money.

In the former, money is demanded for carrying out transactions and thus it emphasises upon the spending aspect of money. The cash balances approach, on the other hand, is concerned with the holding aspect of money. According to it, the essential reason, why money is demanded, is to hold it as an idle asset for diverse human motives. This led Robertson to remark that cash balances approach is concerned with "money sitting," and the transactions approach with "money on the wings."

(iv) *Difference in respect of P* : The variable price level (P) in Fisher's equation is not identical with the price level (P) in the cash balance equation. Whereas price level in transactions equation refers to the general price level, it signifies the price level related to a particular commodity (wheat) or the price level of the final consumption goods in the cash balance approach.

(v) *Nature of transactions* : The volume of transactions T, in Fisher's model denotes an aggregate of all transactions while the cash balance equation concerns itself with the real national income or the consumption of goods and services alone.

(vi) *V is mechanical while K is a psychological concept* : The velocity of circulation of money (V) in transactions equation is measured by the speed with which a unit of money changes hands and is thus a mechanical concept depending upon the development of banking, duration of the period of payments and the spending habits of the people etc. But the variable K, in cash balance equation, depends on the psychological factors.

(vii) *Nature of velocity of circulation* : Fisher's transactions velocity model is concerned with the transactions velocity of circulation of money. The cash balance equation, on the contrary, takes into account the income velocity of circulation of money (i.e., the number of times a monetary unit circulates for buying the final national product).

(viii) *Difference in the method of determining price level* : The Cambridge approach attempts to explain the price level or the value of money in terms of demand for and supply of money. But the transactions equation approaches the problem almost exclusively from the supply side and the determination of the value of money stands divorced from the general theory of value.

(ix) *Fundamentally different approaches* : The most significant element in the cash balance equation K, marks a genuine break of this approach from the transactions velocity model of Irving Fisher. Bringing out the distinction between the cash balance and Fisherine approaches, A.H. Hansen remarks : "In the Marshallian analysis a shift in K may start an upward or downward movement. It is K, not M, that holds the stage."

3. SUPERIORITY OF CASH BALANCES APPROACH OVER TRANSACTIONS APPROACH

The cash balances approach is regarded as superior to the transactions approach in following respects :

(i) *Prominence to human values and motives* : The emphasis upon K in the cash balance approach brings into prominence the subjective valuation and a diversity of human motives which influence the price level. The transactions velocity model, on the contrary, is based on highly mechanistic apparatus.

(ii) *Causal process* : Fisher's approach relates the changes in price level to the changes in quantity of money. But, the money-price relationship explained through that model is deficient on the ground that it lacks the causal process. The cash balance approach, however, is capable of explaining how the price level can undergo changes irrespective of a constant stock of money. A change in the desires of the community to hold more or less of cash balances may raise or lower the price level even though the quantity of money remains unchanged.

(iii) *Importance both to demand for and supply of money* : The cash balances approach, unlike Fisherine approach, is not one-sided. While the latter visualises the supply of money as only effective determinant of the value of money, the former emphasises both the demand for and the supply money as the determinants of the value of money or the price level.

(iv) *Right emphasis on K* : The cash balances approach gives much importance to K. The analysis of the variations in K offers scope for the study of a number of important problems like expectations, uncertainty, rate of interest etc. which were altogether overlooked in the traditional transactions velocity model.

(v) *More convenient* : Kurikara has pointed out that the Cambridge equation, $P = M/KT$, and transactions equations $P = MV/T$, apparently seem to be exactly alike, assuming that V and K are reciprocal to each other. But still, the former is more convenient than the latter, since it is easy to know how large cash balances individuals hold relative to their total expenditure than to know exactly the amount they spend for all kinds of transactions.

(vi) *Proper explanation of cyclical phenomenon* : Marshall has opined that the variable K is more significant for analysing the phenomenon of business fluctuations than the Fisherine V . During depression, as the desire to hold money increases, K goes up and the value of money increases while the price level falls. On the opposite, when a distrust in currency develops among the people, the inclination to hold it decreases, K goes down and the value of money falls while the price level goes up.

(vii) *Emphasis on income* : According to A.C.L. Day, Cambridge approach emphasises upon a very important new element. It concentrates not upon the total volume of transactions but the level of income. It makes this approach more useful both from the analytical and practical viewpoints.

In Marshallian approach, the demand for money is a function of the level of income. The demand for cash balances varies with the size of income. Given the supply of money and a specific level of income, the behavioural changes in K result in the fluctuations in incomes and prices. If we suppose that $K = 0.6$, the money demand function (KY) with respect to income has been shown in Table 1.

TABLE 1
Relation between Income and Money Demand

Y [in Crores of Rs.]	KY
500	300
600	360
700	420
800	480
900	540
1000	600

If money supply is fixed by the monetary authority and is independent of the level of income, the latter is determined by the intersection of money supply function (M_0) and the demand function (KY) as shown in Fig. 2.

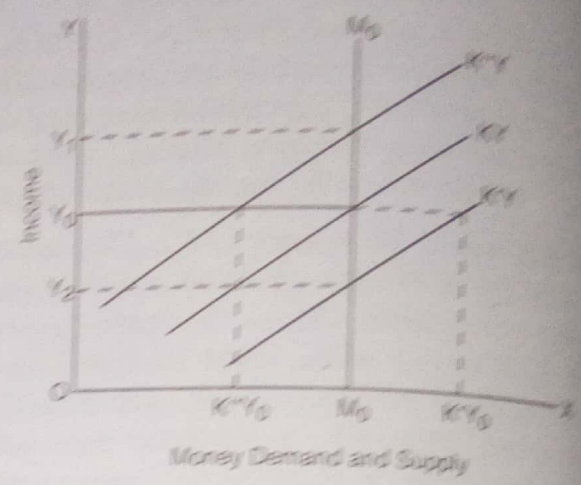


Fig. 2.

If the money supply is in excess of the demand for money as at Y_2 level of income, the excess cash may be utilised by the community for the additional holding of goods. That will push up the level of income as well as of prices till the equilibrium income Y_0 is determined. On the other hand, if the demand for money is in excess of money supply, the people may off-load their holding of goods to hold larger cash balances. The prices and income, as a consequence, fall and income tends to approach the equilibrium level of income Y_0 . Now if K increases, the KY function shifts to $K'Y$ and at equilibrium income Y_0 , the desire for cash balances is greater than the fixed money supply M_0 . The money demand function $K'Y$ comes into equilibrium with M_0 at a lower level of income Y_2 . Similarly a decrease in K , causing a shift in money demand function to $K''Y$, given the supply of money at M_0 , pushes up the level of income to Y_1 .

The effect of shifts in K and consequently in money demand function can be analysed in another way also. At Y_0 level of income, when money demand function shifts from KY to $K'Y$, the desired cash holding $K'Y_0$ is greater than M_0 . Everyone, in this situation, will try to increase his cash holdings. There will be a tendency to unload the stocks of goods in exchange for money. This will lower the prices and also cause a curtailment in output and income from Y_0 to Y_2 . When K decreases and the money demand function shifts to $K''Y$, the demand for money

at Y_0 level of income is $K''Y_0$ and it is less than M_0 . People in these circumstances will attempt to reduce their money holdings. A tendency to increase the stock of goods in preference to the holding of cash will appear. This will push up prices and also the output and income.

(viii) *Development of liquidity preference theory*: The cash balances approach has led to the development of the modern liquidity preference theory which is of great significance in the explanation of levels of income and employment.

(ix) *More realistic*: The Cambridge approach, with its emphasis on K , is more realistic than Fisher's transactions approach which emphasises V because the basic truth is that money is such an asset which must always be held by some one or the other.

4. CRITICISM OF THE CASH BALANCE APPROACH

Although the cash balances approach seems to be a distinct improvement upon the transactions approach, yet it suffers from certain shortcomings which are given below:

(i) *Tautology*: Whichever way the Cambridge equation is stated, $M = KPO$, $M = KPT$ or $M = KY$, it is just as much a tautology as the transactions equation. The theory suffers from the circular reasoning since, on the one hand, it assumes that the value of money or price level is determined by the cash holdings (K) of the community and, on the contrary, it suggests that the value of money or price level determines the amount of cash held by the people.

(ii) *Not dynamic proper analysis*: The cash balances approach provides a set of equations which are merely exercises in comparative statics and are too simple to analyse a dynamic economic system. As a part of monetary theory, the approach proves to be inadequate to explain the dynamic price behaviour in the economy.

(iii) *Narrow approach*: A very notable drawback in the cash balance equations is that they deal with the value of money in terms of consumption goods alone. This is a very narrow view of the determination of price level. It is quite illogical to restrict the concept of the purchasing power of money only to the consumption goods like wheat.

(iv) *Excessive emphasis on real income*: This approach lays excessive emphasis upon the real income as a determinant of K . This tendency makes the Cambridge economists ignore other important determinants of K like the price level, extent of business integration, monetary and banking habits of the people and the level of economic development.

(v) *Constancy of K and T* : The cash balances approach, just like the transactions approach, assumes K and T as constant. Thus it is liable to all such criticism as is levelled against Fisher's transactions approach.

(vi) *Purposes of holding*: The levels of income, output and employment are also influenced by the changes in the proportion in which deposits are held for different purposes, viz., saving, investment etc. The cash balance equation fails to take into account such changes.

(vii) *Neglect of thrift, productivity etc.*: In any comprehensive theory of the value of money, it is essential to consider the elements like thrift, productivity and liquidity preference etc. but the cash balance equation tends to overlook these elements.

(viii) *Neglect of distribution of general demand between consumer and capital goods*: Another flaw in the Cambridge equation is that it fails to take cognisance of the distribution of general demand between the capital goods and consumer goods and its effect upon income, output, employment and prices.

(ix) *Fails to determine the extent of change in prices and output in relation to variations in money supply*: The Cambridge approach, no doubt, recognises that changes in the quantity of money can bring about short run changes in prices and output, yet it fails to explain by what extent the prices and output change as a consequence of a change in the supply of money.

(x) *Ignores liquidity preference among different groups*: The changes in the cash balances held by different groups of the people exercise a significant impact upon the prices and output. The cash balance equations take into account simply the overall changes in the proportion of cash held by the community out of their real income. But it fails to take into account the changes in the liquidity preference among different groups.

(xi) *Absence of complete analysis of demand for money* : A very significant flaw in the cash balances approach is that the total demand for money in the community has not been properly analysed. The theory essentially supposes that the cash is held by the community to buy the total output. Thus the demand for money is regarded primarily as a medium of exchange. The precautionary motive for holding cash finds a vague and incidental mention in this analysis and speculative demand for money or the assets demand for money has been entirely neglected.

(xii) *Omission of rate of interest* : If the asset demand function of money is ignored, it amounts to the assumption that money is used exclusively for carrying out transactions and that the changes in the quantity of money leave rate of interest unaffected and hence there is no explicit role for interest rate in economic activity. In this respect, the cash balances approach, therefore, remains secluded from the whole body of the monetary theory. In the words of Patinkin, "In particular, they cannot serve to validate the classical proposition that a change in the amount of money leaves the rate of

interest unaffected. Indeed, not only can they not help, they hinder. For the omission of the rate of interest from the cash balance equation creates the misleading impression that the classical invariance of this rate holds only in the special case where it does not affect the demand for money."

(xiii) *Uniform unitary elastic demand* : The cash balances approach rests on the proposition that the demand for money has uniform unitary elasticity since an increase in K leads to an equi-proportionate fall in the price level and vice-versa. Such a possibility, according to Patinkin, does not exist as the demand function for money is less than uniform unitary elastic.

(xiv) *Neglect of real balance effect* : This approach is deficient, according to Patinkin, also because it fails to recognise the real balance effect.

Despite all these shortcomings, the cash balances approach has made positive contribution to the monetary theory in respect of approaching the problem of determining the value of money from a more strategic angle—the demand for money.

Questions